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Comparative study of forest restoration projects in China and Philippines

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Comparative Study of Forest Restoration Projects in China and Philippines

by

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ABSTRACT

Nie.G.2021. Comparative Study of Forest Restoration Projects in China and Philippines.

Key words: Forest restoration project, natural forest restoration, forest restoration processes, farmers, government funding

This article mainly compares two restoration projects in developing countries, one in China and the other in the Philippines.

Both developing countries are located in Asia and have similar population densities, and both have destroyed large tracts of forests because of large numbers of crops. But the plans and processes of these two projects are quite different. The restoraiton project in the Philippines applied the traditional method of returning farmland to forests to plant fruit trees on the land. In China, a large area of abandoned wasteland has been transformed into a park full of greenery for people to relax and entertain. Therefore, this article will compare these two projects with similar premises and backgrounds but completely different practices through the follow-up development of the project, ecology and economy, and select a restoration project that is more in line with the local conditions and benefits the local people.

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1.0 INTRODUTION

China and the Philippines are both located in Asia and both are developing countries. Both countries have a large population base and therefore have a huge demand for food. This also makes agriculture is the main reason for reduction of forestry. According to the 2001 report of the United Nations Food and Agriculture Organization, the green coverage in 2000 is 3.8 billion hectares, compared with 3.96 billion hectares in 1990(United Nations Environment Programmed report), the forest cover area has been reduced by more than 100 million hectares. Especially compare with developed countries, agriculture occupies a more important position in developing countries. The first, most developing countries have more populations than developed countries. Therefore, the demand for food in developing countries is far greater than that in developed countries. Second, agriculture is the main source of income for most developing countries.

Although these two restoration projects are carried out in China and the Philippines, which have similar backgrounds and premises, the plans of the two restoration projects are completely different. The restoration project in the Philippines chose the traditional way of returning farmland to forest and planting fruit trees on the original plot. The restoration project in China is to build a park full of greenery on the original wasteland. Therefore, this article will compare the subsequent development of the two restoration projects and their ecological and economic impacts to compare which of the two projects that use different methods for woodland restoration is more beneficial to the locals.

1.1 The basic situation of Philippines

The Philippines covers an area of about 30 million hectares and contains 7107 islands. In 2014, the Philippines had 71 regions, 81 provinces, 144 cities, 1490

municipalities and 42029 barangays. The population is about 107 million the population density is 363 persons/km2. 75 percent of them live on agriculture. (Greg 2013)

1.2 The basic situation of China

China covers an area of 9.6 million square kilometers, covering 31 provinces and 687 cities, 4 municipalities, 2 SARs, 293 prefectural-level cities. As of 2019, there are 14000.5 billion people in China. According to the 2010 census results, the per capita land area is 139.58 people / km2. Similarly, China is also a big agricultural country. Most people live on agriculture, which is also the main source of the country's economy. (Gao, 2020)

The data will be obtained from secondary sources of data, which include government websites and journal articles and will help to yield information on the practices undertaken in both Philippines and China, especially, concerning forest restoration activates.

1.3 Objective

The first thing that comes to mind when mentioning China's forestland restoration projects is Returning Farmlands to Forest Projects. China's tuigeng huanlin or “Returning Farmland to Forest” (RFFP) program has been widely praised as the world's largest and most successful payment for ecosystem services program, as well as a major contributor to China's dramatic increase in forest cover from perhaps as low as 8% in 1960 to about 21% today. (Trac, C. 2014). Returning farmland to forests is indeed very effective in improving the ecological balance, but there are many other ways to improve the ecological balance and restore forest land. Therefore, this article chooses the Chinese restoration project, which uses the construction of parks to restore woodland under similar backgrounds and premises, and the Philippines restoration project, which is the first attempt to use the traditional method-returning farmland to forest to restore woodland, for comparison. Both are first attempts and

are therefore more contrasting.

From the follow-up maintenance of the project and its economic and environmental impact, the two resettlement projects were compared, and a restoration project that locals could merge was selected.

1.4 Hypotheses

H0 The restoration in China make the locals more profitable than the restoration project in Philippines

H1 The restoration in Philippines make the locals more profitable than the restoration project in China

2.0 MATERIALS AND METHODS

2.1 Introduction of Restoration Project in Philippines

Data collected from reading articles. （Gregorio，2020）

Restoration project is part of the research activities of the project ASEM 2010 / 050 improving watered rehabilitation outcomes in the Philippines through systems approach. The restoration project started in the second quarter of 2014. The site is Cambrian, a 26-hectare highland of Caibiran, Biliran Province. Figure 1 shows the location of the restoration project in Philippines. (Gregorios2020)

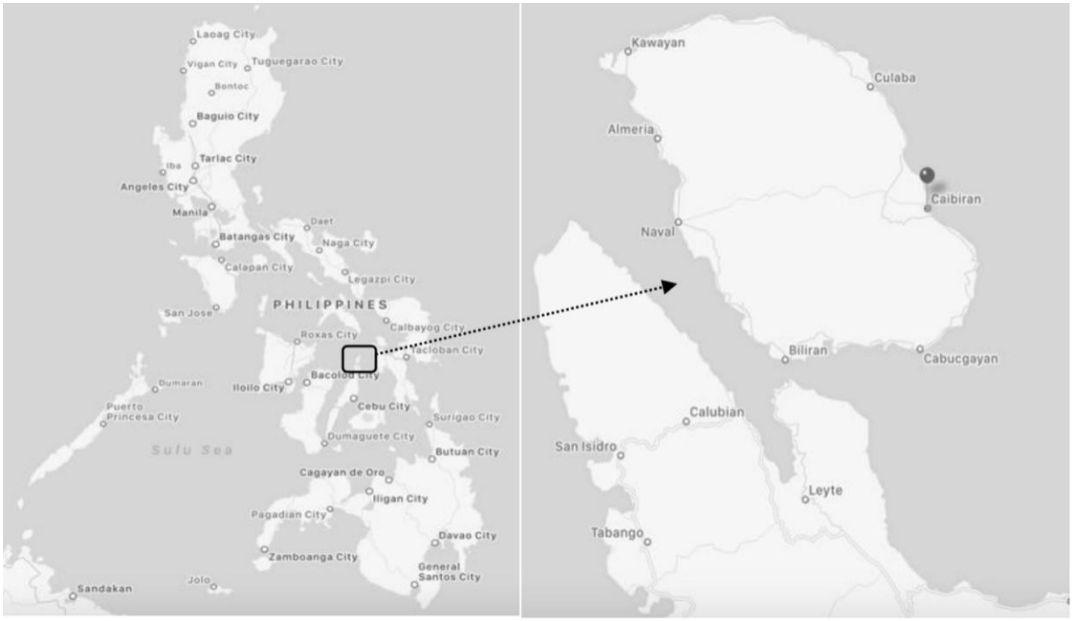

Figure 1. Location of the restoration project in Phlippines

Source: Google Earth

This area receives government funding and jurisdiction, and local farmers sign a contract with the government. The contract includes afforestation plan and forestry management plan for this land. The period of 25 years can be extended for another 25 years as appropriate. （Gregorio，2020）

The restoration project in the Philippines is mainly divided into two stages. At the first stage, considering these lands is the main income for the farmers the

government decided to plant fruit trees on this land. But everything is not as smooth as planned, the survival rate of saplings was very low less than 10% due to fires and grazing. This is mainly due to the lack of basic knowledge and experience of farmers in planting fruit trees and the corruption of some lawbreakers. Therefore, the government took a series of measures to improve the project, and the project entered the second phase. （Gregorio，2020）

The biggest change at this stage is that the government invited a team of experts from Australia to jointly solve the forestland restoration problem. Learning from the failures of the first stage, the professional team in Australia made the following improvements to the restoration plan and program. The first is to train local farmers and learn relevant knowledge to provide sufficient preliminary preparations for forestland restoration projects. One of the chief culprits of destroying woodland in the past is that farmers who have taken up land are trained not to set fires or graze domestic animals in the park. This has greatly reduced the damage to forest land. At the same time, the mother trees in the local natural forests were counted and marked, and policies were introduced to protect these mother trees from being felled. Secondly, improve the quality of the seedlings, and use appropriate fertilizer to remove the surrounding weeds to improve the survival rate of the seedlings. The research team planted pineapples, cassava, taro and sweet potatoes in fire prevention forests to ensure food security and reduce fire prevention cost. The last is to make finances transparent and open to prevent corruption. After completing these tasks, the research team established ten permanent plots in the area to test the growth status of trees. In order to adjust the policy in time to ensure the ecological balance （Gregorio，2020）.

2.2 Introduction of Restoration Project in China

This part of the data comes from its designers' articles. (Fan, 2016)

China's restoration project started in 2016, called the eucalyptus forest ecological restoration project. The site is located in Shatang Town, Liubei District, Guangxi Province. (Fan, 2016) The figure 2 shows the location of the restoration project i China.

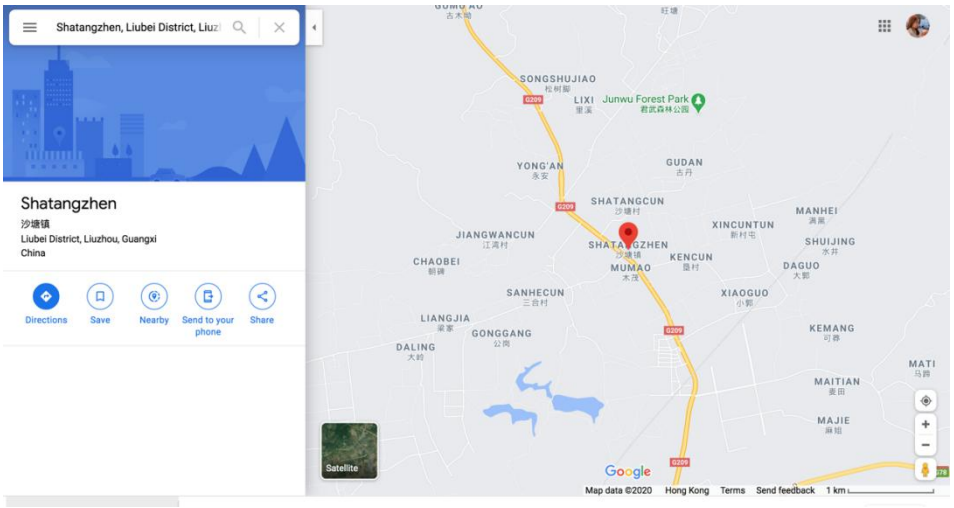

Figure 2. Location of the restoration projet in China

Source: Google Map

This restoration project in China is different from Return Farmland to Forestry Program (RFFP). The area for the restoration project is not a farmland but a deserted mountainous land. There are only scattered plantings in this area, so economic development is relatively slow. (Fan, 2016) In addition, the land in this area still has single species, low land fertility, and ecological environment imbalance. So, the government decided to transform the sub-region into a leisure park.

There are 3 design sections in the Guangxi Eucalyptus Forest Ecological Restoration Project. The first plot is called Jiangwan Fishing and Sea Sports and Fitness Section (839 hm 2), this section revolves around the existing Jiangkeng Reservoir, combined with the ecological transformation of eucalyptus forests, forming

a suburban forest park area with sports and leisure as the main area.

The second plot is called Shatang urban and rural countryside recreational plate (404 hm2). This section protects and utilizes the existing villages, combined with the transformation of shelter belts, to create an urban leisure area integrating woodland viewing, tourism, and recreation; The third plot is called Yangshang Pastoral Comprehensive Demonstration Section (1 5 4 1 hm 2), this section mainly Relying on the municipal nursery forest farm, guide the participation of villagers in Yangliu Village, Shangdong Village, and Guocun Village, so that tourism will gradually promote the revitalization of the countryside and build a comprehensive pastoral demonstration area. (Fan, 2016)

The area will be transformed and repaired mainly from three aspects.

The first is the design of these three plots is based on the different geographical locations and their own conditions of the three plots. （Fan , 2016） For example, there are many villages and farmland in plot 2, and the transportation network is relatively complete. So, the designer added a slow-walking system to plot 2, setting up a walkway, running track and bicycle lane. In this way, it can not only meet the needs of people who live in cities for a healthy life, but also allow tourists to visit local villages and experience the joy of farming in farmland.

The second point is to expand the water area and improve water quality. Expand the original water system area in the site and transform the artificial wetland. On the one hand, it satisfies people’s feelings of being hydrophilic and on the other hand increases the biodiversity in the site. （Fan, 2016） Because of the pure plantation with eucalyptus in the original area, the lack of ecosystem functions has led to a decline in water quality and quantity in the original area. Therefore, while expanding the water area, it is necessary to purify the water. Purification of the water is mainly

through plant purification and gabion filtration. （Fan, 2016） Plant purification is to use aquatic plants to purify water, while gabion filtration is to set up ecological gabions to purify water.

The third is to carry out soil remediation. Mainly use physical repair and biological repair. Reduce perceived interference and provide nutrients from animals to achieve the purpose of reducing the effects of chemical components and drugs. Restore the soil to its natural state and ensure ecological balance.

3.0 RESULTS

The following Table is a comparison of the economic income of the two projects in China and the Philippines before and after th project.

	GDP Before	GDP After	Change
Guangxi Liubei(RMB)	480 billion	642.1 billion	75%
barangay Kawayanon(USD DOLLORS)	284.6 billion	304.9 billion	93%

Table 1. Compaction of GDP in he two areas

3.1 Results of the Philippines restoration project

The restoration project in the Philippines has achieved great success. The purpose of the restoration project in the Philippines is to bring economic benefits to local farmers while restoring forest land. In this project, they took measures such as protecting the mother tree, and made outstanding contributions to the restoration of the local forest land and the stabilization of the ecological balance. In 2017, the former deputy minister of DENR （the company that undertook this project) publicly praised the project. We can also see from Table 1 that the local GDP of the project has increased by 93%. Of course, the GDP growth is not entirely due to this project, but there are other factors. But we can say that this project has promoted a substantial increase in GDP.

The success of this project is mainly reflected in two points. The first point is that the food crops grown in the garden not only meet the food needs of local farmers but also bring additional income to these farmers. And with the successful development of the project, the number of active families joining the program has increased by 36. The project also received support from the local government about 10,000 U.S. dollars. The land area has also increased from six hectares at the beginning of the project to 41 hectares. This also provides prerequisites and necessary

conditions for the diversity of later crops (Gegorio, 2020).

3.2 Result of China restoration project

The restoration project in China has also been successful, although the economic improvement is not as significant as the restoration project in the Philippines.

Chinese project success is mainly to improve the local soil environment. Because the human disturbance is reduced, the land has time and conditions to repair itself and the nutrients provided by the livestock to the land. This effectively improve the status quo of declining land fertility. Thereby achieving the purpose of restoring ecological diversity and promoting ecological balance.

In addition, the country park provides a bright spot for the entire city. Its characteristic projects preserve the local natural scenery and promote the development of local tourism to achieve the purpose of driving the local economic development.

4.0 DISCUSSION

4.1 Disadvantage of the Philippines restoration project

Although local farmers have been ideologically educated in the preliminary preparations for the project, the phenomenon of illegal tree felling still exists and it is difficult to completely eliminate it. Even many people who fell trees are relatives of the project leaders and benefit from felling trees. Such an approach invalidates the community's protection and conservation policies related to the mother tree. In order to put an end to this practice, the community needs a lot of funds to ensure regular patrols in the forest area. But this undoubtedly increases the cost of the project and also increases the possibility of conflicts with the local farmers. （Gregorio， 2020）

The lack of management resources for expanding agriculture and forestry in the process of forest expansion is another big problem. With the success of the project, the forest resources managed by the company expanded from 6 hectares to 41 hectares. Because of the limited resources of the management, the inability to take care of all aspects of the 41 hectares of land has resulted in the lower survival rate of the crops planted in the 41 hectares. As a result, the trust and participation of local farmers in the project was greatly reduced.Gregorio， 2020）

4.2 Disadvantage of China restoration project

The maintenance of the park requires long-term investment of a large amount of manpower and material resources, which increases the cost of the entire project.

Because human activities in the park, such as picnics, the garbage generated by walking will cause environmental clutter, and if the hammock is used during the picnic, it will also cause damage to the trees. Because of China's large population base, even if the probability of occurrence is very low, the number of occurrences is still

huge. Therefore, damage to trees must also be considered.

Secondly, due to long-term activities of human beings here, such as a lot of fishing, they are trampled to death for fear of insects, and they are fed with food that is difficult for other species to digest. These actions affect the land of other species. Such as squirrels, fish, brds and insects.

4.3 Improvement for Philippines restoration project

Drawing lessons from the relatively mature experience of returning farmland to forests in other countries, this project can have the following improvements.

First, let more local farmers' families participate in the land conversion, not just the families that provide land to participate in the project (Zhang, Z. 2017). Allowing more people to participate in the project and forming a larger community of interests can reduce unauthorized logging and other damage to the forest restoration plan. While protecting the mother tree, it also greatly reduces the possibility of conflicts between local farmers. In addition, the participation of more peasant families can alleviate the problem of labor shortage to a certain extent. Improve production efficiency and maximize benefits. This also promoted the project invisibly, and the related knowledge about the project was also passed on to more peasant families in a subtle way. This provides an important foundation for the follow-up and development of the project.

The second point is that different locations have to make different plans (Zhang, Z. 2017). Consider the different conditions of each location, such as climatic conditions, sudden situations, topography, etc. Develop different plans for different basic conditions. One of the reasons why the restoration project in the Philippines could not be carried out in the future was that the same model was applied to all land parcels. Did not consider the advantages and disadvantages of implementing the plan

at each location to change the plan. In this way, after making different plans and improvements according to different locations, the survival rate of trees will be greatly improved, and the probability of success of the project will also be greatly improved.

Besides these,the main problem of the restoration project in the Philippines appeared in the later maintenance. In response to this problem, there are two areas that need to be improved. The first aspect is to allocate sufficient funds in a timely manner so that the crops can be collected and sold in a unified manner. Forty percent of the profit is given to participating farmers and the remaining 60 percent is taken back by the company for future forestland maintenance. On the other hand, it is recruiting or training relevant talents. After the increase in the area of forest land, the lack of management has led to a decline in the survival rate of crops planted in forest land, which means that a large number of talents need to be introduced and cultivated. The responsibilities of each piece of forest land are assigned to individuals, and then the upper management of the company will manage these people in a unified manner. Such a production method will increase the survival rate of crops, and can discover and solve problems in time. It is also possible to train farmers participating in the project and participate in the planting of crops. This ca also save costs.

Finally, the purpose of woodland restoration is not only to rebuild forests, but also to ensure biodiversity and maintain ecological balance. Biodiversity is very important to the stability of the ecosystem (Mukul, S. 2016). But because the main purpose of this restoration project is to harvest fruits, there is no way to completely eliminate human interference in this fruit forest. Drawing lessons from other restoration projects, a set of inspection procedures should be designed to observe the growth and ecological conditions of forest land (Cruz, Rex O. 2007). It is similar to

using indicator species to observe forest conditions.

4.4 Improvement for China Restoration Project

For the rest of the restoration project in China, it is also crucial to the maintenance of the park. This is similar to the restoration project in the Philippines, which requires regular and timely disbursement of funds, and employs relevant plant maintenance personnel to be responsible for the construction and maintenance of plants. In addition, it is more important to protect the living environment of the animals in the park and reduce the damage to their habitats caused by human activities. In response to this problem, the suggestion is to regularly check the species and the number of each type of animal in the park, and adjust relevant policies in time to ensure species diversity and ecological balance. At the same time, strengthen the patrol in the park, prohibit smoking in the park, hanging hammocks and other behaviors that are not conducive to ecological balance. Increase the number of fire hydrants so that even parts of the fire hydrants are in the garden so as to cover all corners. At the same time, ensure the unblocked fire exit. To ensure that accidents can be dealt with in time.

CONCLUSION

Both projects were successful. What they have in common is that while improving the ecological environment, it also increases economic benefits. The restoration project in the Philippines has improved economic benefits more significantly and steadily brought practical economic resources to each farmer participating in the project, and improved the basic living conditions and quality of life of local farmers. It's like sending charcoal in the snow. In contrast, the restoration project in China is more like icing on the cake. It did not bring real economic income increase to local residents. What this project brings to the residents is an extra place for leisure after dinner and tea. At the same time, as a tourist attraction, it has enhanced the visibility of the entire city, attracting more investors and educational resources to this city. Judging from the follow-up development, the management and follow-up maintenance of the Philippine restoration project has not improved with the successful development of the project, so there have been many problems mentioned in the previous article. The follow-up maintenance and management of the restoration project in China is also continuously updated. The success of the project cannot only be based on the benefits of the previous few years, so from a long-term perspective, the restoration project in China is even better.

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